$$f(x) = \begin{bmatrix} f(x_0, u_0) - x_1 \\ f(x_1, u_1) - x_2 \\ f(x_2, u_2) - x_3 \\ f(x_3, u_3) - x_4 \\ f(x_0, u_{04}) - x_4 \\ x_0 - 0 \end{bmatrix} \begin{matrix} \left.\begin{matrix} \\ \\ \\ \\ \end{matrix}\right\} \text{odometry constraints} \\ \} \text{ loop closure constraints} \\ \\ \end{matrix}$$

$$\begin{bmatrix} x_0 + u_0 - x_1 \\ x_1 + u_1 - x_2 \\ x_2 + u_2 - x_3 \\ x_3 + u_3 - x_4 \\ x_0 + u_{04} - x_4 \\ x_0 - 0 \end{bmatrix} \begin{matrix} \to f_1 \\ \to f_2 \\ \to f_3 \\ \to f_4 \\ \to f_5 \\ \to f_6 \end{matrix}$$

$\frac{df_1}{dx_0} = 1$, $\frac{df_1}{dx_1} = -1$, all other derivatives $= 0$

$\frac{df_2}{dx_1} = 1$, $\frac{df_2}{dx_2} = -1$, all other derivatives $= 0$

$\frac{df_3}{dx_2} = 1$, $\frac{df_3}{dx_3} = -1$, "

$\frac{df_4}{dx_3} = 1$, $\frac{df_4}{dx_4} = -1$, "

$\frac{df_5}{dx_0} = 1$, $\frac{df_5}{dx_4} = -1$, "

$\frac{df_6}{dx_0} = 1$, "

Hence, we get $J = \begin{bmatrix} 1 & -1 & 0 & 0 & 0 \\ 0 & 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 1 & -1 \\ 1 & 0 & 0 & 0 & -1 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}$

(we found derivatives wrt $x_0, x_1, x_2, x_3, x_4$)